

We claim:

1. A method for reducing the evolution of hydrogen sulfide vapors within a sanitary sewer system, comprising the steps of:

adding an iron salt to a wastewater stream within said sanitary sewer system upstream of hydrogen sulfide volatilization to produce free iron ions which react with said hydrogen sulfide to form iron (II) sulfide; and

adding an oxidant to said wastewater stream downstream of said iron salt addition to regenerate free iron ions from said iron (II) sulfide.

2. The method of claim 1 wherein said oxidant is hydrogen peroxide.

3. The method of claim 1 wherein said iron salt is selected from the group consisting of ferrous chloride, ferrous sulfate, ferric chloride, ferric sulfate, and mixtures thereof.

4. The method of claim 1 wherein said regenerated free iron ions are ferric ions.

5. The method of claim 1, further comprising the step of adding an anionic polyelectrolyte to said wastewater stream at said wastewater treatment plant.

6. A method of enhancing solids separation in a primary clarifier comprising:  
adding an iron salt to a wastewater stream in a wastewater collection system upstream of hydrogen sulfide volatilization to produce free iron ions which react with said hydrogen sulfide to form iron (II) sulfide;

adding an oxidant to said wastewater stream downstream of said iron salt addition to regenerate free iron ions from said iron (II) sulfide, which free iron ions react with said hydrogen sulfide to reform iron (II) sulfide; and

adding an oxidant to said wastewater stream at the inlet of a wastewater treatment plant prior to entry of said wastewater to said primary clarifier.

7. A method of treating wastewater at a wastewater treatment plant comprising:

adding an iron salt to a wastewater stream in a wastewater collection system upstream of hydrogen sulfide volatilization to produce free iron ions which react with said hydrogen sulfide to form iron (II) sulfide;

adding an oxidant to said wastewater stream downstream of said iron salt addition to regenerate free iron ions from said iron (II) sulfide, which free iron ions react with said hydrogen sulfide to reform iron (II) sulfide; and

adding an oxidant to said wastewater stream at the inlet of a wastewater treatment plant to regenerate free iron ions from said reformed iron (II) sulfide.

8. A method of enhancing sulfide control in an anaerobic digester comprising:

adding an iron salt to a wastewater stream in a wastewater collection system upstream of hydrogen sulfide volatilization to produce free iron ions which react with said hydrogen sulfide to form iron (II) sulfide;

adding an oxidant to said wastewater stream downstream of said iron salt addition to regenerate free iron ions from said iron (II) sulfide, which free iron ions react with said hydrogen sulfide to reform iron (II) sulfide; and

adding an oxidant to said wastewater stream in a wastewater treatment plant prior to entry of said wastewater to said anaerobic digester.

9. A method for reducing the evolution of hydrogen sulfide vapors within a sanitary sewer system, comprising the steps of:

adding an iron salt to a wastewater stream within said sanitary sewer system upstream of hydrogen sulfide volatilization to produce free

iron ions which react with said hydrogen sulfide to form iron (II) sulfide;

making a first oxidant addition to said wastewater stream downstream of said iron salt addition to regenerate free iron ions from said iron (II) sulfide;

adding an oxidant to said wastewater stream downstream of said first oxidant addition by at least about 4 hours hydraulic retention time, and upstream of a wastewater treatment plant.

10. The method of claim 1 wherein said iron salt is added to said wastewater stream in an amount of at least 0.50 pounds Fe per pound sulfide controlled calculated as pounds  $H_2S$ .

11. The method of claim 2, wherein said hydrogen peroxide is added to said wastewater stream in an amount of at least 1.0 lbs  $H_2O_2$  per pound sulfide controlled calculated as pounds  $H_2S$ .

12. The method of claim 10 wherein said iron salt is added to said wastewater stream in an amount of at least 0.67 pounds Fe per pound sulfide controlled calculated as pounds  $H_2S$ .

13. The method of claim 1 wherein said iron salt is added to said wastewater stream in a stoichiometric amount calculated based on the amount of sulfide controlled.